

REMARKS/ARGUMENTS

This response is being submitted within three months of the shortened statutory period for responding to the Office Action made on July 31, 2003. Therefore, no Petition and Fee for Extension of Time are filed with this Response.

Hereinafter the Claims that are pending prior to the entry of the Amendment in this Response are called "Current Pending Claims." This Response amends Currently Pending Claims 1 and 17-27. Please add new claims 30-46. Please cancel Currently Pending Claim 29 without prejudice. Upon Amendment, the above-identified U.S. Patent Application will have four independent Claims (Currently Amended Claims 1 and 17 and New Claims 32 and 33) and 45 total Claims (Currently Pending Claims 2-16, 28, Currently Amended Claims 1 and 17-27, and New Claims 30-46). The applicants previously paid for up to 3 independent Claims and 29 total Claims. Therefore, a fee is due for one excess independent Claim and 17 additional excess total Claims; and a check for this fee is enclosed herewith.

1. Specification

Applicants submit an abstract on a separate sheet as required by 37 CFR 1.72 (b).

2. Support for Amended and New Claims

Support for Amending Currently Pending Claims 1 and 17-28 and New Claims 30-46 can be found, in inter alia, the original filed application as follows:

- ✓ Amended Claim 1: Original Claim 1 and page 5, lines 25-30;
- ✓ Amended Claim 17: Original Claim 17, page 8, lines 24-26, and example 1;
- ✓ Amended Claims 18-23: Original Claims 18-23;
- ✓ Amended Claims 24: Original Claim 17, page 8, lines 24-26, and example 2;
- ✓ Amended Claims 25-28: Original Claims 25-28;

- ✓ New Claim 30: Original Claim 24;
- ✓ New Claim 31: Page 5, lines 26-31;
- ✓ New Claim 32: Original Claims 1 and 8;
- ✓ New Claim 33: Original Claim 17;
- ✓ New Claim 34: Original Claim 18;
- ✓ New Claim 35: Original Claim 24;
- ✓ New Claim 36: Original Claim 25;
- ✓ New Claims 37-40: Original Claim 17;
- ✗ New Claim 41: Original Claim 1 and page 5, lines 25-30;
- ✓ New Claim 42: Page 5, lines 26-31;
- ✓ New Claim 43: Original Claims 1 and 8;
- ✗ New Claim 44: Original Claim 1 and page 5, lines 25-30;
- ✓ New Claim 45: Page 5, lines 26-31;
- ✓ New Claim 46: Original Claims 1 and 8.

3. Claim Rejections – 35 U.S.C. §112, First Paragraph

The Examiner rejects Currently Pending Claim 29 under 35 U.S.C. §112, first paragraph, in item 3 on page 2 of the Office Action because the specification allegedly does not reasonably provide enablement for *any* combination *regardless* of sequence. The Applicants respectfully traverse this rejection. Moreover, this rejection is now moot and should be withdrawn because Dependent Claim 29 has been canceled.

4. Claim Rejections – 35 U.S.C. §112, Second Paragraph

The Examiner rejects Currently Pending Claims 17-29 under 35 USC §112, second paragraph, in item 5 on page 3 of the Office Action as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention because Currently Pending Claim 17 recites the phrase “with the help of an reactive gas” in step c).

Applicants submit an Amended Claim 17 wherein the phrase “with the help of a reactive gas” has been canceled. The rejection is now moot and should be withdrawn.

5. Allowable Subject Matter

The Examiner indicated in Item 10 on Page 5 of the Office Action that Claims 17-28 would be allowable if rewritten to overcome the rejection(s) under 35 USC §112, second paragraph, to include all of the limitations of the base claim and any intervening claims. Applicants respectfully submit that Claim 17 and subsequent Dependent Claims 18-28 have been amended in order to overcome the rejection under 35 USC §112, second paragraph, as discussed in the preceding section.

6. Allowable Claim 17

Currently Amended Claim 17 has been further amended by canceling the original step c) “irradiating ion beams on either or both surfaces of the annealed precursor film.” This limitation is now recited in Amended Claim 24.

Applicants submit that the cancellation of step c) is supported by disclosure in *inter alia* on page 8, lines 24-26 “... In addition, before coating, the irradiation of ion beams with the help of the reactive gas may be performed ...”. Currently Amended Claim 17 therefore does not violate the written description requirement of 35 U.S.C. 112. See MPEP 2163(I)(b).

Applicants further submit that example 1 does not describe carrying out the irradiation step. It is believed that the specification bears a reasonable correlation to the entire scope of Currently Amended Claim 17. Therefore, Currently Amended Claim 17 satisfied the enablement requirement of 35 U.S.C. 112. See MPEP 2164.01(b). Furthermore, Applicants submit that the claimed genus of Currently Amended Claim 17 can be used in the same manner as disclosed in example 1 without undue experimentation. See MPEP 2164.02.

Currently Amended Claims 17 is allowable and Dependent Claims 18-28 and Dependent New Claim 30 are therefore allowable as well.

7. Claim Rejections – 35 U.S.C. §102

The Examiner rejects Claims 1-5 9, 12-13, and 15-16 under 35 U.S.C. §102 (b) as being anticipated by U.S. Patent No. 4,438,185 (hereinafter called “TASKIER”).

Currently Amended Claim 1

Independent Claim 1 has been amended and has the following wording:

A multi-component composite membrane comprising active layers and support layers,

- wherein a support layer is located between active layers,
- wherein the active layers have pores having a pore size and a pore distribution, and
- wherein the support layers have pores having a different pore size and a different pore distribution.

Applicants agree with the Examiner that TASKIER does not teach or suggest the recited active layer polymers in Claim 6 as acknowledged by the Examiner on Page 5, first paragraph of the Office Action. The Applicants further submit that TASKIER further does not teach or suggest that the active layer has pores and that the pore size and distribution of the support layers and active layers are different from each other. Currently Amended Claim 1 is not anticipated by TASKIER. Applicants submit that since currently Amended Claim 1 is not anticipated by TASKIER, Dependent Claims 2-16 are not anticipated by the prior art either.

New Independent Claim 32 recites the pore size of an active layer is equal to or less than 10 μm . Applicants submit that TASKIER does not teach or suggest that an active layer has pores.

Furthermore, TASKIER does not teach or suggest that pore size of an active layer is equal to or less than 10 μm . Therefore, New Claim 32 is not anticipated by TASKIER.

8. Claim Rejections – 35 U.S.C. §103

The Examiner rejects Currently Pending Claims 1-16 under 35 U.S.C. §103(a) as being unpatentable over TASKIER in view of U.S. Patent No. 5,716,421 (hereinafter called “PENDELWAR.”)

TASKIER teaches coated microporous membranes, which exhibit improved wettability and can be used in alkaline storage batteries and particularly in batteries having electrode systems containing zinc and silver electrodes. See Column 1 lines 10-15. TASKIER teaches the process for rendering a normally hydrophobic microporous membrane hydrophilic and reducing the electrical resistance thereof which comprises applying a coating to the surface of said membrane in a manner sufficient to achieve coating thickness when dry of from about 1 to about 25 microns. See Claim 1 in Column 32. TASKIER further teaches that microporous films, which can be employed as substrates and which can have an average pore size of about 200 to about 10,000 \AA . See lines 5- 8 in Column 18.

TASKIER teaches to produce a non-porous precursor film and subjecting the non-porous precursor film to cold stretching and hot stretching. See example 1, Part A in Column 26. TASKIER teaches then to employ the microporous film as a substrate for the deposition of a non-porous layer. See example 1, Part C in Column 26. TASKIER does not teach an active layer having porous.

Applicants respectfully submit in regards to New Claim 31 that it recites
“pores of the support layer being formed by a stretching process
after orienting a polymer crystalline region in a certain direction
and the pores of the active layer being formed by a stretching

process after forming a densely structured polymer film through phase-inversion.”

Applicants submit in regard to New Claim 31 that TASKIER does not teach any technique to introduce pores into the deposited layer.

Applicants respectfully submit in regards to New Claim 32 that it recites “a pore size of an active layer is equal to or less than 10 μm .”

Applicants respectfully submit that TASKIER does not include teaching or suggestion to modify the teaching in order to introduce pores into the deposited layer.

After the Examiner acknowledges that TASKIER does not teach the claim limitations as recited in Currently Pending Claims 7-8 and 10-11, he asserts that PENDALWAR discloses that it is known in the art to use polyvinylidene fluoride, polyurethanes, and other polymers recited in Claim 6 as the active layer on a composite membrane, wherein the polymers are applied to a support layer via a polymer solution containing a suitable solvent such as n-butanol as recited in Currently Pending Claim 7.

PENDALWAR

Applicants respectfully submit that PENDALWAR teaches an electrolyte for electrochemical cells and more particularly a method for making electrochemical cells using polymer gel electrolytes. See Column 1, lines 1-4. PENDALWAR teaches an electrolyte system which combines the properties of mechanical integrity, as well as the ability to absorb sufficient amounts of an electrolyte active species so as to produce an electrolyte system with the high ionic conductivity characteristic of liquid electrolytes. See Column 2, lines 35-40.

PENDALWAR teaches a rechargeable electrochemical cell including a first and second electrodes and a porous separator element having first and second major sides. PENDALAR also teaches coating of the electrodes with a layer of gelling polymer, which gelling polymer

will, when exposed to an electrolyte active species and heat, bond the porous separate element to the electrodes. See Claim 1 in Column 6.

Applicants respectfully submit that PENDALWAR does not teach or suggest a membrane with a support layer and active layers, but a porous separator, which is coated with a gelling polymer.

Applicants submit that PENDALWAR does not teach or suggest an active layer with porous.

Applicants further submit in respect to New Claim 31 that PENDALWAR does not teach or suggest any way to introduce pores into the support layer and the active layer.

Applicants respectfully submit that PENDELWAR does not include teaching or suggestion to modify the teaching in order to introduce pores into the deposited layer.

The Examiner asserts in the second paragraph on Page 5 that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use known membrane-coating polymers as disclosed in PENDALWAR in the composite membranes of TASKIER depending on the chemical resistance, transport characteristics, and other physical properties required for a specific application. The Examiner further asserts that one of ordinary skill in the art would have selected the porosity of the active layer, air permeability and wetting properties of the membrane as recited in Currently Pending Claims 8 and 10-11. The Applicants respectfully traverse the Examiner's assertion.

The Examiner is respectfully reminded that in order to establish a prima facie case of obviousness, three basic criteria must be met.

- First, there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings.
- Second, there must be a reasonable expectation of success.
- Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP § 2142.

The Examiner is further respectfully reminded that the teaching or suggestion to make the claim combination and the reasonable expectation of success both be found in the prior art and must not be based on Applicants' disclosure. See MPE § 2143.

Applicants respectfully submit that none of the references in TASKIER or PENDALWAR explicitly or implicitly suggest the claim limitation in Amended Claim 1 and New Claim 32. Moreover, the combined references do not teach or suggest all the claim limitations of Amended Claim 1 and New Claim 32. Furthermore, none of the references include any suggestion or motivation to one of ordinary skill in the art to modify the references. Applicants submit as explained in the proceeding section that TASKIER does not teach or suggest a membrane with a porous coated layer. PENDALWAR does not teach or suggest a porous coated layer, but a gelled coating. Applicants submit that there is clearly no motivation for someone of ordinary skill in the art to modify the membrane of TASKIER in order to make the claimed invention.

Applicants respectfully submit that the combined teaching of TASKIER and PENDELWAR does not teach or suggest active layers with pores. There is no expectation of success to combine the teachings of the two references. If a person skilled in the art would combine the teachings it would suggest coating a support layer with a layer of gelling polymer. Applicants respectfully submit hence the gelling layer does not have pores the permeability of the membrane deteriorates. Therefore, in case an active layer that does not have pores, if applied to a battery, electrolyte movement, i. e., lithium ion movement, deteriorates and causes deterioration of the battery performance. Therefore TASKIER and PENDALWAR do not apply to the claimed invention.

Applicants respectfully submit the difference between a membrane having a coating layer with pores as described in example 1 of the specification with a membrane having a coating layer without pores as described in comparative example 1 of the specification. The membrane according to example 1 has a much better performance, as can be seen in Table 1 on page 13 of the description. This result is unexpected and surprising.

The Examiner does not refer to anything in the cited references themselves that would motivate someone with ordinary skill in the art to modify the cited references to produce the Applicants claimed invention wherein the pore size and the distribution of the support layer and active layers are different from each other. Instead, the Examiner simply asserts that it would have been obvious to someone with ordinary skill in the art to modify the reference TASKIER wherein a membrane contains a pored support layer and non-porous coated layer. The Examiner's assertion appears to be based on common knowledge in the prior art. Section A of MPEP 2144.03 explains when it is appropriate to take official notice without documentary evidence to support the Examiner's conclusion. According to the first sentence of Section A of MPEP 2144.03 "official notice unsupported by documentary evidence should only be taken by the Examiner when the facts asserted to be well-known or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known." Similarly, according to the fourth sentence of Section A of MPEP 2144.03, "the notice affects beyond the record which may be taken by the Examiner must be capable of such instant and unquestioned demonstration as to defy dispute."

In the Office Action, the Examiner asserts that it would have been obvious to someone of ordinary skill in the art to modify TASKIER by selecting the porosity of the active layer as recited by Currently Pending Claim 8 and recited by Amended Claim 1. However, this assertion is not supported by the cited references TASKIER and PENDALAR because none of the cited references disclose or suggest modifying the membrane so that the pore size and distribution of the support layer and active layer are different from each other. Moreover, this assertion is impermissible under MPEP 2144.03 because the assertion is not "capable of such instant and unquestioned demonstration as to defy dispute." Consequently, the Examiner's assertion is improper and should be withdrawn.

For the foregoing reasons, the Examiner should withdraw the assertion that it would have been obvious to someone of ordinary skill in the art to modify TASKIER wherein a membrane with a porous support layer and non-porous coating as disclosed to produce the Applicants' claimed invention wherein the pore size and distribution of the support layer and active layer are different

from each other. Since the prior art does not teach or suggest to produce the Applicants' claimed invention, Currently Amended Claim 1 and New Claim 32 are not obvious over the prior art. New Claim 33 is also believed to be allowable for the reasons that are set forth in item 11 on page 6 of the outstanding Office Action.

All of the remaining claims (Subclaims 2-16, 30, 31, 34-46) are allowable at the very least because they are each directly or indirectly dependent on an allowable base claim (independent Claim 1, 17, or 33). In addition, all of these remaining claims are further nonobvious over the prior art because the prior art does not teach or suggest the particular limitations that are recited in these subclaims.

Reconsideration of the amended application is respectfully requested. The application is now in condition for allowance. Allowance of the application at an early date is respectfully requested.

Applicants reserve the right to seek protection for any unclaimed subject matter, either subsequently in the prosecution of the present case or in a divisional or continuation application.

This response amends Currently Pending Claims 1 and 17-27; cancels Currently Pending Claim 29; and adds New Claims 30-46. The amendments, cancellations, and additions that are described in the preceding sentence were done to more fully claim the invention and were not done to overcome rejections under 35 U.S.C. § 112, to overcome the prior art, or to overcome any other rejections or objections. The amendments, cancellations, and additions that are described in the first sentence of this paragraph shall not be considered necessary to overcome rejections under 35 U.S.C. § 112, shall not be considered necessary to overcome the prior art, and shall not be considered necessary to overcome any other rejections or objections.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136 (a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

Respectfully submitted,

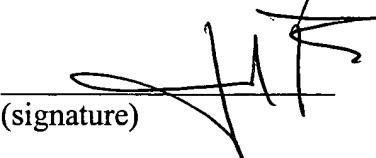

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